

REMARKS

This is an amendment filed in the above mentioned application in response to the Official Communication mailed on September 9, 2005. Entry of the amendment, reexamination and allowance of the application is requested.

The Examiner's careful and thorough review is appreciated.

In response to the Examiner's communication, and to clarify the definition of the subject matter sought to be patented, claims 1-12 are cancelled without prejudice and replaced by new claims 13-36.

The various issues discussed by the numbered paragraphs in the Examiner's DETAILED ACTION are addressed below.

Specification

1. The specification, Paragraph [0001] is amended to identify the current status of domestic priority claim under 35 USC 120.
2. The hyperlink in Paragraph [0001] is deleted.
3. Inconel®, as used in Paragraph [0034] is generically referred to in the alternative, as "a family of trademarked nickel-chromium-iron alloys."
4. The status of related applications in Paragraphs [0020], [0032] and [0035] is updated.

In Paragraph [0018], → replaces = in the equation.

In Table I, the "+/-" terminology is replaced by the term "approximate".

Superfluous reference numbers in Table II are deleted and replaced by "in" and "out" references to conform the table to corresponding modules shown in Figure 1 as amended.

Drawings

A corrected drawing sheet for Figure 1 marked "Replacement Drawing" is submitted with this amendment. The corrections to Figure 1 cure the objections to the reference numerals, flow depictions, and references in the specification pointed out by the Examiner. Paragraph [0035] is amended to refer to flow channels 331 and 332 in Figure 3C.

Claim Analysis

10. The subject matter claimed is consistently identified as an apparatus in claims 13-30 and as a power source in claims 31-36.

Claim Objections

11. In presenting the new claims, rewritten as apparatus claims, the Examiner's objections to the original claims were considered; the objections are expected to be resolved in the new claims.

Claim Rejections - 35 USC Section 102

12. *The rejection of claims 1-4 and 8-12 under 35 USC Section 102 based on Tonkovich et al. (WO 99/00186)*

Tonkovich *et al.*, and the Examiner's conclusions regarding the original claims have been considered. As rewritten, the claims define syn gas apparatus in which fuel cell off gas is routed to the combustor to heat the steam reformer. The sections of Tonkovich *et al.*, referenced by the Examiner do not disclose a system where, in a segment of a syn gas producing cycle, an operatively disposed combustor is interconnected to receive fuel cell off gas to heat a steam reformer. At page 9, lines 26,27, Tonkovich *et al.* require "[T]he dilute hydrogen is introduced into the fuel vaporizer ..." to provide a dual pass through the fuel cell. Thus, Tonkovich *et al.* do not describe apparatus for producing a syn-gas, as set out in independent claim 13, or an in line apparatus for operating a fuel cell with a hydrocarbon fuel

source as set out in claim 31, where the fuel cell off gas is cycled to the combustor to power the steam reformer. The elements of the claimed apparatus relating to combustor/steam reformer module characteristics, the in line assembly of components, and component characteristics, in syn gas and fuel cell cycles, respectively described in dependent claims 14-30 and 32-35 likewise incorporate an interconnection in the apparatus in which off gas fuels the combustor. Accordingly, the rejection should be withdrawn because the claims are in fact differentiated from the Tonkovich *et al.* reference.

Claim Rejections - 35 USC Section 103

14.-15. The rejection of claims 5-6 under 35 USC Section 103 based on Tonkovich *et al.* (WO 99/00186) in view of Bonville *et al.* (WO 99/67018): Tonkovich *et al.*, and Bonville *et al.* have been considered in view of the Examiner's conclusions regarding the original claims 5 and 6 relating to a second heat exchanger and storage tanks. Counterparts of claims 5 and 6 in the new claim set, claims 17, 21, 22 and 33 describe additional modules and tanks that may be switchable in the syn gas and fuel cell apparatus of independent claims 13 and 31. The dependent claims are further distinguished over Tonkovich *et al.*, and Bonville *et al.*, in that claim 17 defines side by side alternating micro channels in the module and claims 21 and 33 define a switchable tank coupled to a start module and/or combustor. Neither Tonkovich *et al.*, nor Bonville *et al.*, alone, or in combination, suggest the overall syn gas and fuel cell apparatus claimed in which the additional module, having defined characteristics, and the storage tank, having a relationship in the interconnection of the cycle as defined are included.

16. The rejection of claim 7 under 35 USC Section 103 based on Tonkovich *et al.* (WO 99/00186) in view of Dixon (USP 3,929,430) should likewise be withdrawn in view of the new

set of claims. In the counterpart of claim 7, claim 23, an additional module includes an in-line zeolite cracker in a syn-gas apparatus where a heat exchanger with alternating side by side micro channels is interconnected in the device where off gas is directed to a combustor that powers a steam reformer. No such apparatus is suggested by the proffered combination.

Double Patenting

17.-20. The new set of claims includes claims 13-30, apparatus for producing a syn gas, and claims 31-35, apparatus for operating a fuel cell with a hydrocarbon fuel source. While each claim group is directed to literally different subjects, each group includes common components in defined relationships in the same invention configured to produce a specified result, namely, a syn gas in claims 13-30 and a hydrocarbon fuel source fuel cell in claims 31-35. United States Letters Patent 6,716,400 claims an ignition system and starter, likewise defined through components in a defined relationship configured to produce a result in which a fuel cell system is induced to commence operation. The "start module" referenced in the claims herein (claims 18, 20, 22 and 33) need not replicate the start module of Patent 6,716,400. In any event, Patent 6,716,400 does not duplicately patent, nor render obvious with other reference[s], the specified configurations of apparatus and components for producing a syn gas or operating a fuel cell as is set out in claims 13-36.

If merely a similar module may serve as a basis for a double patenting rejection, then an analogy can be made that if a transistor is first patented, then circuits using different configurations of transistors and other components in useful applications, such as micro processors, amplifiers, phase lock loops, *etc.*, cannot be separately patented as apparatus. This is not the case. Each useful apparatus may be separately patented.


For these reasons, the double patenting rejection should be withdrawn. Alternatively, if the double patenting rejection is maintained after allowance, applicant requests the opportunity to further respond at that time and/or file a terminal disclaimer.

Conclusion

21.-22. A new set of claims is submitted to better define the invention; the specification is corrected; and a substitute drawing is provided.

In view of the foregoing and the remarks above, reexamination, reconsideration and allowance is respectfully requested.

Respectfully submitted,

By: 

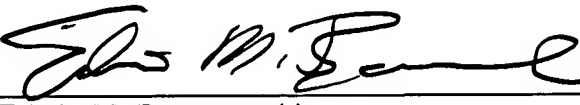
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CERTIFICATE OF FILING BY EXPRESS MAIL

I hereby certify that this **AMENDMENT IN RESPONSE TO THE OFFICIAL COMMUNICATION MAILED ON SEPTEMBER 9, 2005** accompanied by Transmittal Form PTO/SB/21, Extension of Time Request, Fee Determination Sheet form PTO/SB/06, and a postcard receipt, is being deposited with the United States Postal Service by Express Mail Receipt No. EV 491170847

US in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA
22313-1450 on December 28, 2005.


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In the application:

Inventors: SEABA ,James and BROOKS ,Christopher J.

Serial Number: 10/689,246

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For: MICRO COMPONENT LIQUID HYDROCARBON REFORMER SYSTEM AND CYCLE FOR
PRODUCING HYDROGEN GAS

Group Art Unit: 1764

Examiner: Basia Ridley

Atty. Docket No.: 3994994-131917

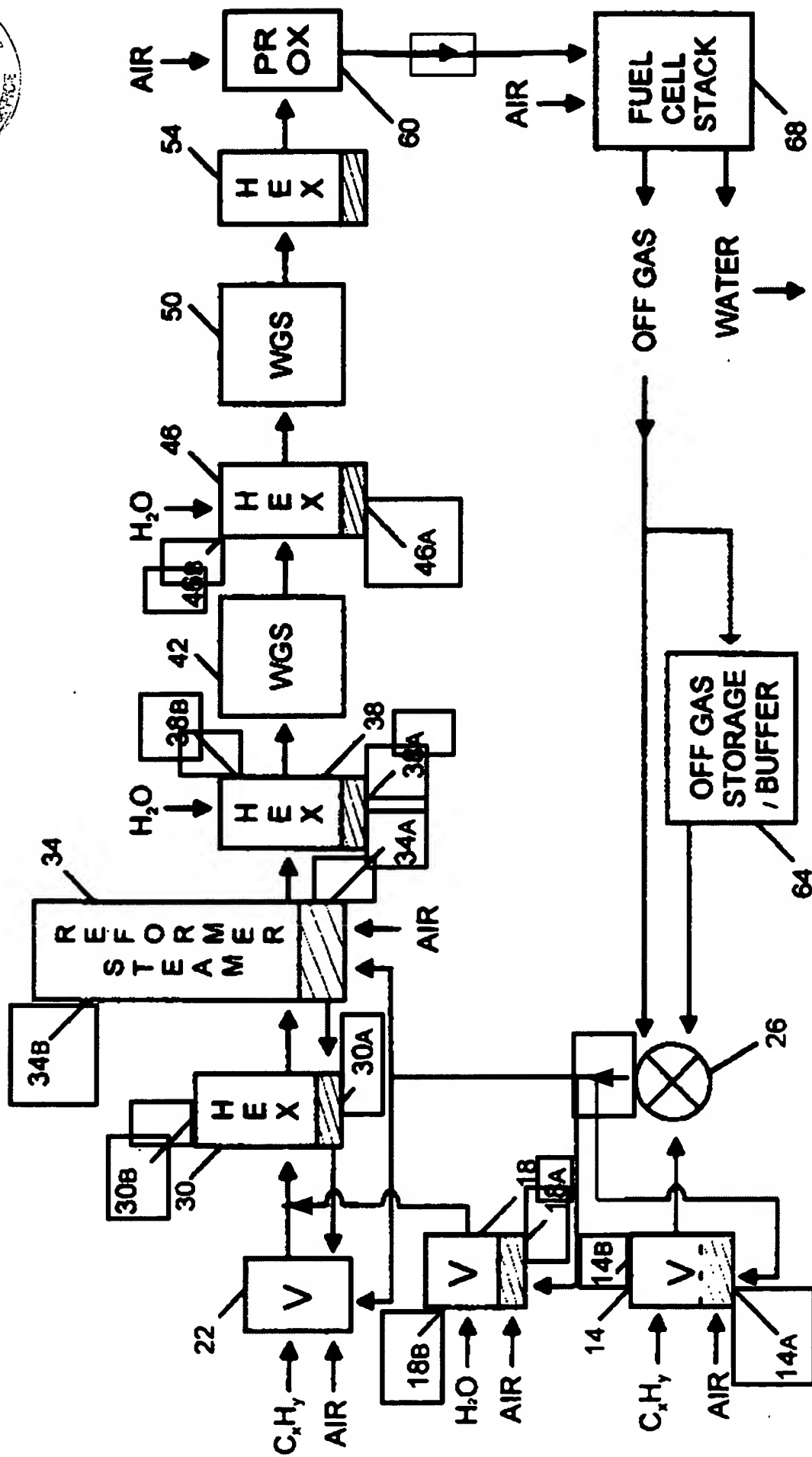


Figure 1